

### **REMARKS/ARGUMENTS**

Claims 1, 2, 4-11, 13-20, and 22-27 remain pending in the application.

Applicants have amended the independent Claims 1, 10, and 19, to recite adjusted quality scores based upon “a penalty for the overlapping of the selected probes”, as discussed during an interview with the Examiner. The support for the amendments can be found, for example, in page 30 and 31 and Figure 14 of the specification. Applicant asserts that no new matter is presented by these amendments and respectfully request entry of the same.

#### ***Attorney’s Statement of the Substance of the Interview under 37 C.F.R. § 1.133***

Applicant’s representative thanks the Examiner for a personal interview on December 15, 2004. Applicant’s representative, Mr. Wei Zhou, and Examiner Mary K. Zeman participated in the interview.

Applicant’s representative and the Examiner discussed the rejection under 35 U.S.C. § 102(e). Applicant’s representative argued that probe overlapping is evaluated in the claimed invention to reduce information redundancy. According to the instant application, desirable probes should have no or minimal overlapping. The Examiner suggested that Applicant amend the Claims to emphasize that the claimed process penalize overlap, rather than favor overlap. Applicant’s representative agrees to amend the claims according to the Examiner’s suggestion.

The Examiner indicated that “these potential amendments would appear to obviate the rejection under 102, pending final review.” (see, also, Examiner’s interview summary, dated 12/15/2004).

Applicant's representative requests a clarification of the section 1.105 requirement for information. The Examiner explained that she would be interested in copies of publications relating to probe selection by the inventor. The Examiner would also want additional references relating to probe selection for microarrays.

***Rejections under 35 U.S.C. § 102(e)***

Claims 1, 2 4-11, 13-20, and 22-27 are rejected under 35 U.S.C. as allegedly being anticipated by Shannon et al. Applicant respectfully disagrees. However, for the purpose of expediting the issuance of claims, Applicant has amended the independent claims to recite adjusted scores based upon "a penalty for the overlapping of the selected probes."

Shannon et al. (US 6,251,588 B1) discusses selecting oligonucleotide probes by evaluating clustering of filtered candidate probe sequences (Figure 1, '588 patent) to select qualified probes that are clustered around one or more regions. According to the specification of the '588 patent, selecting probes in a cluster is preferably because:

[O]ligonucleotides showing high hybridization efficiencies tend to form clusters. It is believed that this clustering reflects local regions of the target nucleotide sequence that are unstructured and accessible for oligonucleotide binding. Oligonucleotides that are contiguous along a region of the input nucleic acid sequence are identified. These oligonucleotides are sorted based on the length of the contiguous sequence elements. The sorting approach used in the present invention apparently serves as a surrogate for the calculation of local secondary

structure of the target a nucleotide sequence. ...The identification of contiguous sequence elements is a simple and efficient method for recognizing clusters of such determinants and, thus, for identifying oligonucleotide probes that exhibit high hybridization efficiency for a target nucleotide sequence. (col. 19, line 27).

Therefore, Shannon et al. evaluates the probe quality based upon the overlapping (clustering) of candidate probes. Candidate probes that are in the largest clusters are selected (Figure 1).

In contrast, the amended Claims are directed to a method of selecting probes by penalizing overlapping. As taught by the specification pages 30-31, the process is to reduce information redundancy. By penalizing overlapping, the selected probes will be more representative of the target sequence. The amended claims are directed to a process that is very different from Shannon et al.'s method of selecting probes in largest clusters of probes. Since Shannon et al., does not teach penalizing overlapping of probes, this rejection of claims under section 102 is obviated by the amendments.

***Requirement for information under 37 C.F.R. § 1.105***

Applicant responds to this requirement by submitting a Form 1149A citing relevant references. For publications other than US patent documents, a copy of each of the references is also provided. Concise good faith explanations of cited references, if appropriate, are provided in this section.

The Examiner requested copies of each publication which any of the applicants authored or co-authored and which describe the disclosed subject matter of *computer-*

*implemented methods of selecting probes utilizing quality scores.* In response, Applicant submits herewith copies of references B1-B8. The references are coauthored by the Applicant and they are generally related to probe selection for microarray. In particular, reference B6 is related to methods utilizing quality scores.

The Examiner requested title, citation, and copy of each publication that is a source used for the description of prior art in the disclosure. The Examiner also requested that, for each publication, a concise explanation of that publication's contribution to the description of the prior art. In response, Application submits herewith reference A 1, US Patent No. 5,424,186, which was used to provide a background about nucleic acid probe arrays; reference A2, which was used to provide a background about predicting affinity; and reference A2, which was used to provide a background about probe selection.

The Examiner requested title, citation, and copy of each publication that any of the applicant relied upon to develop the disclosed subject matter that describes the applicant's invention. In response, Applicant submits reference A3, which discloses various ways to calculate quality scores for probe selection purpose.

The Examiner requested title, citation, and copy of each publication that any of the applicants relied upon to draft the claimed subject matter. In response, Applicant submit reference A3. Reference A3 disclosed various ways to calculate quality scores. The instant application claims the use of adjusted quality scores. The adjusted quality scores incorporated information about how the probes overlap. The independent claims all recite adjusted quality scores that are related to probe overlapping. In the amended claims, all independent claims recite penalizing the overlapping of selected probes.

During a personal interview, the Examiner also requests background information about probe selection technology. In response, Applicant submits references A4-A36. These references provide additional information about microarray probe selection. For example, references A3 and A4 provide information about computerized microarray probe design process.

### **CONCLUSION**

For these reasons, Applicants believe all pending claims are now in condition for allowance. If the Examiner has any questions pertaining to this application or feels that a telephone conference would in any way expedite the prosecution of the application, please do not hesitate to call the undersigned at (408) 731-5000.

The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account 01-0431.

Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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